



UNDERSTANDING THE CULTURAL ANTHROPOLOGY OF WATER BY INVESTIGATING THE HISTORY OF WORLD'S FAIRS: AN ALERT FOR NEEDED RESEARCH

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ABSTRACT

Human society is more complex than ever before. The demands for fresh water resources are greater than any time in history. As humans engage in a period of history focused on the availability and quality of fresh water (the age of water) the need has never been greater to reexamine human history with water to educate and improve future management of the resource. Water has always been a central and integrative theme of human culture and indicator of technological advancement. Contemporary management all too often reflects a culture of belief that water is available in nearly unlimited supplies. However, that culture is changing with population growth, agricultural expansion, urbanization and changes in historic weather patterns. History provides the greatest illustrations of human culture and much can be learned through untapped reference collections such as world's fairs. Such collections can supply a glimpse in to the realities (a snapshot) of the time and thus provide an unrivalled historic reference. History shows that while cultural philosophies may not have markedly changed, extraction and use of fresh water certainly has. Water has always been a central and integrative theme of world's fairs and Expositions, which now provide reconstructions of water use and philosophy of the past and thus guidance for the future. World's fairs collections (and other such resources) can provide the needed platform to transform human water culture towards a future of security and sustainability.

Key Words: Water, Water Security, Anthropocene, Age of Water, World's Fairs, Fresh Water

Introduction

Water as a Resource: Art and Engineering

Society's perceptions of water historically flow in tandem with the physical and natural environment, cultural resources and societal needs (West, 2007; Groenfeldt, 2010; Orenco and Alaix, 2013; Hooper and Hubbard, 2014). From nearly the beginning of history, humans possessed an innate intuition that water is essential for survival. It may not be surprising then that the earliest civilizations were founded along the banks of rivers and otherwise in close association with large water bodies (Biswas, 1970). In terms of stewardship of the resource, historical evidence indicates that humans have generally been less worried about sustaining the resource and more concerned about controlling it, often through ditches, drainages and a myriad of ingeniously engineered structures. For example, King Scurion of Egypt (approximately 3200 B.C.) was shown in a painting to "cut the first sod" of an irrigation ditch for agriculture. During the reign of Seostris I, (approximately 1950 B.C.) the Nile River and the Red Sea were connected by an immense navigational canal. The Romans (approximately 100 B.C. to 200 A.D.) built awe-inspiring aqueducts with relatively little understanding of conservation of the resource (Biswas, 1970) (Figure1).

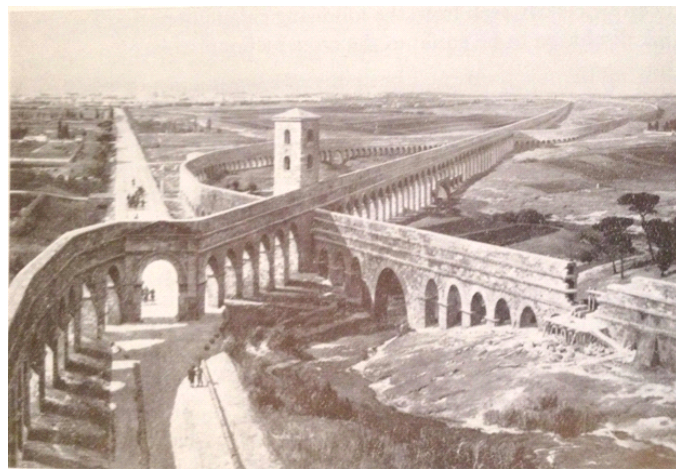


Figure 1. The Anio Novus and the Claudia aqueducts (left foreground) of Rome restored in a single structure and the Marcia, Tepula, and Julia (right). Painting by Zeno Diemer, courtesy of Deutsches Museum, Munich. From Biswas (1970).

World's Fairs: A Historical Reference

Prior to World War II, people were unable to travel as freely as is now common. A world's fair (also known as: World Exposition or Expo) brought the world to the people. London in 1851, Philadelphia in 1876, Chicago in 1893, St. Louis in 1904, San Francisco in 1915 and many others to the present. World Expositions allowed people to see beyond their immediate environment (Findling and Pelle, 2008) and peer into the contemporaneous technologies and resource practices of the time. While early fairs were broad in topic and application, fairs since World War II have been more themed and focused on major concepts and problems. By the 1920's the proliferation of world's fairs lead to the formation of the Bureau of International Expositions (BIE), an international treaty organization, to help control the quality and frequency of the events. With the notable exception of the 1964-1965 New York World's Fair, all of these events since World War II have been held under the sanction or recognition of the BIE (Findling and Pelle, 2008). World's fairs continue to offer the nations of the world an opportunity to come together in a peaceful setting and learn from one another. In-as-much as world's fairs offer an opportunity for global interactions and celebrations of innovations, they also supply a glimpse in to the realities (a snapshot) of the time and thus provide an unrivalled historic reference.

The purpose of this short note is to alert the education and research community to the value of the historical archive held in world's fairs collections (and similar such reference databases). The potential for novel research on any number of topics ranging from art, society, economics (national and international) and other areas of the sciences remain largely untapped. A case study is presented focused on water that provides an insight to how the history of world's fairs can serve as an indicator of human society cultural anthropology of the resource. Conceivably, such archives could be used to better inform policy and assist with cultural shifts necessary for security and sustainable use of fresh water.

Water and World's Fairs

The human inclination to control water through engineered structures has followed civilization into the industrial age and modern times. Examples are perhaps no better illustrated than those presented through what are well over 100 International fairs and expositions held from 1851 to the present (Findling and Pelle, 2008). Water has always been a central and integrative theme of world's fairs and Expositions. For example, a century ago, the Panama Pacific International Exposition (PPIE), often touted as one of the most grand, was held in San Francisco, California, USA from February 20th to December 4th, 1915. The primary goal of PPIE was to showcase and celebrate the completion of the Panama Canal which was officially declared open by President William Taft on January 1, 1915. The Panama Canal expanded the trade route by approximately 13,000 km and promoted less costly passage east for local goods shipping through San Francisco. The exposition was also held for the purpose of showing the recovery

of San Francisco from the great 1906 earthquake and for California to show the world that the State was modern, progressive and powerful as it advanced from the nineteenth to the twentieth centuries. The exposition was used as a pivotal turning point in to a new century of innovation, industrialization and commerce. Expanding over 2.6 km² water was used as infusions of that power and innovation highlighting grand water cascades from great heights to a system of inner-city lakes and fountains, community gardens, and roadways blended with the landscape, skirting the San Francisco waterfront and following the California coast down to the peninsula.

Water features included historic reference to ancient cultures. For example, the lower portions of the Fountains of the Rising and Setting Sun were engineered similar to those in Rome with large bowls placed upon polygonal bases. The Rising Sun was a heroic male poised for flight, while the Setting Sun/Descending Night depicted a languorous maiden with wings half-furled and her face delicately shielded by her hands, all shrouded by incredulous features of water (Ackley, 2015). As the exposition opened, a great fleet of warships from many nations sailed through the Panama Canal, including the United States Fleet and that of Japan, and entered the un-bridged Golden Gate in tribute to the canal and the exposition. San Francisco had never hosted so many warships, not even when the Great White Fleet sailed into the Bay in 1908. People arrived at the fair from the East Coast, sailing in comfort on giant cruise liners through the Panama Canal (Ackley, 2015). The main entrance to the exposition at Scott Street led directly into the South Gardens (Figure 2). In the center of the gardens was the Fountain of Energy designed by A. Stirling Calder. The Fountain of Energy represented the triumph of building the Panama Canal. Great plumes of water poured through the figures into the pool below. Two formal rectangular pools extended east and west with a mermaid fountain at the end of each pool.

The centerpiece of water at world's fairs reached a deliberate pinnacle at the Expo held in Zaragoza, Spain in 2008 entitled "Water and Sustainable Development". The aim of the 2008 Exposition was to reflect on, discuss, and consider solutions to the problems of water and sustainability (Duarte et al. 2015). Coordinated by the BIE, the exposition was developed on the river Ebro and featured great thematic architectural structures including the "Water Tower", which was transparent building over 75 meters high that emulated a drop of water. Other features included the Bridge Pavilion and the River Aquarium, the Igloo of Salt, Cities of Water, Extreme Water, Oikos, Water and Energy, Shared Water and others. More than 100 countries and many dozens of non-governmental organizations, communities, cities, the United Nations and the European Union participated in this event to celebrate water and discuss contemporaneous issues of fresh water sustainability on a global stage (Massad, 2008; Monclus, 2009; Duarte et al., 2015).



Figure 2. The South Gardens of the Panama Pacific International Exposition. Photo courtesy of the Donald G. Larson collection on World's Fairs and Expositions, California State University Fresno Henry Madden Library, Fresno, California, USA.

While clearly of anthropological interest, the historic reference of water in world's fairs is very telling in terms of the culture of water over time. Water has always been perceived as plentiful. The planet is covered more than 70% by water, though most of that is salt water and thus not readily available for human uses (e.g. drinking and irrigation). Ultimately, less than 3% of global water is freshwater, and of that approximately 1% is readily available for human uses (Hubbart, 2010). With all the available water it may be surprising to many that for the first time in human history the availability and security of the resource is at risk. Whether past mismanagement and culture are the culprits is not nearly important as how the resource is managed going forward. Arguably, the culture of disbelief that fresh water is limited must change if large human populations are to be sustained on Earth.

As historic human uses of water resources are investigated, it is useful to consider how demand for the resource has changed in the last 100 yrs. For perspective, in 1915 the global human population was approximately 1.8 billion with about 100 million in the United States of America (USA). Albuquerque New Mexico's population grew from 11,020 in 1910 to 525,000 in 2005. Most of the city's water comes from groundwater, which city officials and the public historically believed would be continually replenished by water from the Rio Grande. In 1993 the United States Geological Survey discovered that water was not replenishing nearly that quickly. Water levels have dropped approximately 160 feet since 1960 alone. Albuquerque's problem is not isolated. The Colorado River (USA) is running dry, setting up a resource battle between homeowners and agriculture. Research indicates that Lake Mead near Reno, Nevada, which currently supplies water to 22 million people, may be dry by 2021 (Barnett and Pierce, 2008). The American West isn't facing a coming water shortage alone. The Ogallala Aquifer lying beneath Nebraska and Kansas, USA is also shrinking due to extensive withdrawals. Steward et al. (2013) reported that if farmers keep irrigating at present rates, 69% of the Ogallala Aquifer will be gone in 50 years. The southern Ogallala Aquifer under the Texas panhandle has dropped 15 feet in the past decade. In fact, more than 40 aquifers across the United States monitored by the U.S. Geological Survey have been depleted dramatically since 2000 alone (Konikow, 2013). In California, which is experiencing its most severe drought in many decades, groundwater use has increased from approximately 40 percent of the annual water budget to more than 60 percent. At these rates, groundwater is being pumped faster than it can be replenished in California's Central Valley, one of the most productive agricultural regions in the world (Famiglietti et al. 2011). These examples are repeated in many locations globally, and in many countries, the situation is much more severe. There has never been a time in history when it is more important to reconsider and restructure how we preserve and sustain fresh water.

Conclusions: Forward Thinking

Water has been the basis for war and the facilitator of peace. The control of water has been a statement of power and technological sophistication, be that through the great aqueducts of Rome, the Panama Canal, or the great fountains of the PPIE. Despite great advances of engineering, humans have drastically altered fresh water availability and quality. Though perhaps not an uncommon scarcity everywhere on the planet, water availability, for the first time in human history, is becoming a long-term, large-scale (Global) problem. Current management reflects a culture of belief that water is available in nearly unlimited supplies. As humans enter the age of water, history can provide guidance moving forward. Much can be learned through historic reference collections including (but not limited to) world's fairs collections.

Through historical perspectives, humans can reconstruct a philosophy of water that intuitively guides actions when management decisions are applied to the resource. Aldo Leopold (1949) coined the term, "land ethic" in his 1949 book *A Sand County Almanac* that had similar context. Leopold wrote of the necessity for a new way of thinking (a philosophy) about the relationship between human beings and the land and the organisms that grow on it. Leopold suggested that ethics needed to expand to include non-human and abiotic factors of the biological community. There is little doubt that fresh water was inclusive in his treatise. The idea of a water ethic is something that transcends the United States Clean Water Act (CWA) that governs water pollution in the United States (Copeland, 2010). This is because, by definition, if humans are observing a sustainable stewardship (ethic) of potable water, humans are also sustaining water quality. It is somewhat ironic then that if humans are able to achieve a sustainable water ethic humans may have greatly reduced need for regulations such as the CWA and diminished need for regulation enforcement and accompanying taxation.

In terms of water ethic, humans need to evolve an instinct that includes an underlying philosophy that when the quality, quantity, aesthetics and resilience of water are met humans are best managing the resource to be sustainable. In this sense, not unlike the tenants that Leopold spoke of, humans ascend from a controller or conqueror of water, as history might currently reflect, to a steward of the resource. There are great resources at our disposal including world's fairs collections to understand the human cultural anthropology of water. An examination of water resources management and philosophies of the past, and legacies of the current time may help humans plan more effectively in the age of water. This article there fore serves as a plea to educators and researchers to consider investigations in the arena of human history to advance future water security and sustainability globally.

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